1.0 Introduction/Background

1.1 Background

The guidance contained in this Laboratory Implementation guidance (LIG) document complements Laboratory Implementation Requirement (LIR) 402-10-01.1, "Stop Work". This LIG is effective on the date of issue, except when noted.

New Mexico is second in the nation in the number of lightning strikes per year. This guidance should be used in safety briefings and other times to provide employees with knowledge of lightning safety.

1.2 Table of Contents

2.0 Purpose

Information contained in this document is intended to provide guidance on personnel safety during thunderstorms.

3.0 Scope/Applicability

The guidance contained in this document applies to Laboratory personnel who are (1) working outside or (2) outside while moving between work locations.

4.0 Definitions

Static potential – a measure of the potential for a lightning strike. Units are Volts/meter.

5.0 Precautions and Limitations

There is no way to predict the probability of a lightning strike at a specific geographic location. There is no way to absolutely guarantee personnel protection from lightning strikes; however, following lightning safety guidance can greatly reduce the risk of injury or death.

6.0 Guidance

6.1 Safer Locations.

When thunderstorms develop, avoid being near high, open places (hills, fields, etc.) or near isolated high points (trees, light poles, etc.). Large enclosed buildings provide the greatest safety from a lightning strike. In general, vehicles (with windows rolled up), provide significant safety if you do not touch the metal surfaces of the vehicle.

If you are caught outdoors and no shelter is nearby, find a low spot (not prone to flooding) away from trees, fences, and poles. If you are in the woods, take shelter under the **shorter** trees. If you are boating, get to land and find shelter immediately. If you feel your skin tingle or your hair stand on end, squat low to the ground on the balls of your feet. Make yourself the smallest target possible, and minimize your contact with the ground.

6.2 Scheduling Work

Thunderstorm season in Los Alamos is generally from June-September; however, thunderstorms have been observed in all months of the year. Thunderstorms typically occur between noon and 9 pm. In many instances, outdoor work can be scheduled to avoid most thunderstorms.

6.3 Lightning Warning

As the number of people working outside increases, or the greater the time needed to reach shelter, consider developing a lightning safety plan, including gathering information on lightning conditions and stop work procedures.

6.3.1 Weather Forecasts. Weather and thunderstorm forecasts for Los Alamos are available at http://weather.lanl.gov/. This information should be used when planning outdoor work/activities.

6.3.2 The weather should be observed. Clouds, gusty winds, and, in many cases, rain are observed before a lightning strike. The clouds are often very tall, with cauliflower-like or turret-like tops, and dark at the cloud base. Louder and more frequent thunder indicates that lightning is approaching your location.

6.3.3 "30-30" Rule. If you see lightning and thunder is heard within 30 seconds (approximately 6 miles), seek shelter. If you hear thunder, but did not see the lightning, you can assume that lightning is within 6 miles and you should seek shelter. Remain in the sheltered location for 30 minutes following the last lightning strike.

6.3.4 Hand held static potential meters. A thunderstorm may develop directly over your location, and so the "30-30" rule will not provide sufficient warning. Hand held static potential meters, or field mills, monitor the potential difference between a cloud and the ground. When the measured potential is greater than 2 kV/m, there is a potential for a lightning strike – seek shelter. (contact RRES-MAQ, 667-7079, for assistance with obtaining information on hand held potential meters)

7.0 Reference

7.1 Documents

Holle, et al 1999, Ronald L. Holle, Raul E. Lopez, Christoph Zimmermann, "Updated Recommendations for Lightning Safety – 1998," Bulletin of the American Meteorological Society, Vol. 80, No. 10, October 1999.

NOAA 1994: "Thunderstorms and Lightning...the Underrated Killers!; A Preparedness Guide," U.S. Department of Commerce, National Oceanic and Atmospheric Administration National Weather Service, Federal Emergency Management Agency, American Red Cross, January 1994, http://www.nws.noaa.gov/om/brochures/trw.htm.

7.2 Document Ownership

The OIC for this document is RRES-MAQ.